

1           WHAT IS CLAIMED:

2           1.       A method for making a multi-pass heat exchanger core comprising  
3 the steps of:  
4                   providing at least one coolant plenum for containing flowing  
5 coolant;  
6                   installing adjacent to the at least one coolant plenum at least one  
7 first-pass plenum for containing a flowing heated fluid and defining a first area-in-  
8 flow of the heated fluid; and  
9                   disposing adjacent to the at least one coolant plenum at least one  
10 subsequent-pass plenum for containing the heated fluid and defining a second  
11 area-in-flow of the heated fluid; and  
12                  arranging the plenums so that the contained heated fluid flows past  
13 a coolant plenum at least twice;  
14 wherein the step of defining a first area-in-flow comprises defining a first area-in-  
15 flow which substantially exceeds the second area-in-flow.

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17          2.       The method of claim 1 wherein:  
18                   the step of providing at least one coolant plenum comprises  
19 providing a plurality of coolant plenums;  
20                   the step of installing at least one first-pass plenum comprises  
21 installing a plurality of first-pass plenums;  
22                   the step of disposing at least one subsequent-pass plenum comprises  
23 disposing a plurality of subsequent-pass plenums; and  
24 further comprising the step of arranging the first-pass plenums and the  
25 subsequent-pass plenums in an alternating manner between cooling plenums,  
26 every second plenum being a cooling plenum.

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28          3.       The method of claim 1 further comprising the steps of:

1                   defining a first plurality of exhaust passages in each of the first-pass  
2   plenums to direct exhaust gases through the first-pass plenums; and  
3                   defining a second plurality of exhaust passages in each of the  
4   subsequent-pass plenums to direct exhaust gases through the subsequent-pass  
5   plenums;  
6   wherein the exhaust passages in each first-pass plenum substantially exceed in  
7   number the exhaust passages in each subsequent-pass plenum.

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9           4.     A method for making a multi-pass exhaust gas recirculation cooler  
10   comprising the steps of:  
11                providing a plurality of coolant plenums for containing flowing  
12   coolant;  
13                disposing adjacent to at least one of the coolant plenums a plurality  
14   of first-pass plenums for containing hot exhaust gases;  
15                disposing adjacent to at least one of the coolant plenums a plurality  
16   of subsequent-pass plenums for containing the hot exhaust gases;  
17                defining a plurality of exhaust passages in each of the first-pass  
18   plenums; and  
19                defining a plurality of exhaust gas passages in each the subsequent-  
20   pass plenums, wherein the exhaust gas passages have substantially equal radial  
21   cross sectional areas, and the total number of exhaust passages in the plurality of  
22   first-pass plenums substantially exceeds the total number of exhaust passages in  
23   the plurality of subsequent-pass plenums.

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25           5.     The method of claim 4 comprising the further steps of:  
26                disposing all the plenums substantially parallel; and  
27                separating the first-pass plenums from the subsequent-pass plenums  
28   with at least one elongate divider substantially perpendicular to the plenums.

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- 1           6.     The method of claim 4 comprising the further steps of:
- 2                 disposing all the plenums substantially parallel; and
- 3                 separating the first-pass plenums from the subsequent-pass plenums
- 4     with at least one elongated divider parallel to the plenums.
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